

in paragraph (g) of this section) shall not operate over a section of track with an average grade of two percent or greater over a distance of two continuous miles until an operable two-way end-of-train device is installed on the train or an alternative method of initiating an emergency brake application from the rear of the train is achieved.

(2) Except as provided in paragraph (h)(1) of this section, a passenger train required to be equipped with a two-way end-of-train device that develops an en route failure of the device (as explained in paragraph (g) of this section) shall be operated in accordance with the following:

(i) A member of the train crew shall be immediately positioned in the car which contains the rearmost readily accessible emergency brake valve on the train and shall be equipped with an operable two-way radio that communicates with the locomotive engineer; and

(ii) The locomotive engineer shall periodically make running tests of the train's air brakes until the failure is corrected; and

(3) Each en route failure shall be corrected at the next location where the necessary repairs can be conducted or at the next location where a required brake test is to be performed, whichever is reached first.

[66 FR 4193, Jan. 17, 2001, as amended at 67 FR 17584, Apr. 10, 2002]

§ 232.409 Inspection and testing of end-of-train devices.

(a) After each installation of either the front or rear unit of an end-of-train device, or both, on a train and before the train departs, the railroad shall determine that the identification code entered into the front unit is identical to the unique identification code on the rear unit.

(b) After each installation of either the front or rear unit of an end-of-train device, or both, on a train and before the train departs, the functional capability of the device shall be determined, after charging the train, by comparing the quantitative value of the air pressure displayed on the front unit with the quantitative value of the air pressure displayed on the rear unit

or on a properly calibrated air gauge. The end-of-train device shall not be used if the difference between the two readings exceeds three pounds per square inch.

(c) A two-way end-of-train device shall be tested at the initial terminal or other point of installation to determine that the device is capable of initiating an emergency power brake application from the rear of the train. If this test is conducted by a person other than a member of the train crew, the locomotive engineer shall be notified that a successful test was performed. The notification required by this paragraph may be provided to the locomotive engineer by any means determined appropriate by the railroad; however, a written or electronic record of the notification shall be maintained in the cab of the controlling locomotive and shall include the date and time of the test, the location where the test was performed, and the name of the person conducting the test.

(d) The telemetry equipment shall be tested for accuracy and calibrated if necessary according to the manufacturer's specifications and procedures at least every 368 days. The 368 days shall not include a shelf-life of up to 92 days prior to placing the unit in service. This test shall include testing radio frequencies and modulation of the device. The date and location of the last calibration or test as well as the name of the person performing the calibration or test shall be legibly displayed on a weather-resistant sticker or other marking device affixed to the outside of both the front unit and the rear unit; however, if the front unit is an integral part of the locomotive or is inaccessible, then the information may be recorded on Form FRA F6180–49A instead, provided that the serial number of the unit is recorded.

[66 FR 4193, Jan. 17, 2001, as amended at 66 FR 29502, May 31, 2001; 67 FR 17584, Apr. 10, 2002]

Subpart F—Introduction of New Brake System Technology

§ 232.501 Scope.

This subpart contains general requirements for introducing new brake system technologies. This subpart is

intended to facilitate the introduction of new complete brake system technologies or major upgrades to existing systems which the current regulations do not adequately address (*i.e.*, electronic brake systems). This subpart is not intended for use in the introduction of a new brake component or material.

§ 232.503 Process to introduce new brake system technology.

(a) Pursuant to the procedures contained in § 232.17, each railroad shall obtain special approval from the FRA Associate Administrator for Safety of a pre-revenue service acceptance testing plan, developed pursuant to § 232.505, for the new brake system technology, prior to implementing the plan.

(b) Each railroad shall complete a pre-revenue service demonstration of the new brake system technology in accordance with the approved plan, shall fulfill all of the other requirements prescribed in § 232.505, and shall obtain special approval from the FRA Associate Administrator for Safety under the procedures of § 232.17 prior to using such brake system technology in revenue service.

§ 232.505 Pre-revenue service acceptance testing plan.

(a) *General; submission of plan.* Except as provided in paragraph (f) of this section, before using a new brake system technology for the first time on its system the operating railroad or railroads shall submit a pre-revenue service acceptance testing plan containing the information required by paragraph (e) of this section and obtain the approval of the FRA Associate Administrator for Safety, under the procedures specified in § 232.17.

(b) *Compliance with plan.* After receiving FRA approval of the pre-revenue service testing plan and before introducing the new brake system technology into revenue service, the operating railroad or railroads shall:

(1) Adopt and comply with such FRA-approved plan, including fully executing the tests required by the plan;

(2) Report to the FRA Associate Administrator for Safety the results of the pre-revenue service acceptance tests;

(3) Correct any safety deficiencies identified by FRA in the design of the equipment or in the inspection, testing, and maintenance procedures or, if safety deficiencies cannot be corrected by design or procedural changes, agree to comply with any operational limitations that may be imposed by the Associate Administrator for Safety on the revenue service operation of the equipment; and

(4) Obtain FRA approval to place the new brake system technology in revenue service.

(c) *Compliance with limitations.* The operating railroad shall comply with each operational limitation, if any, imposed by the Associate Administrator for Safety.

(d) *Availability of plan.* The plan shall be made available to FRA for inspection and copying upon request.

(e) *Elements of plan.* The plan shall include all of the following elements:

(1) An identification of each waiver, if any, of FRA or other Federal safety regulations required for the tests or for revenue service operation of the equipment.

(2) A clear statement of the test objectives. One of the principal test objectives shall be to demonstrate that the equipment meets the safety design and performance requirements specified in this part when operated in the environment in which it is to be used.

(3) A planned schedule for conducting the tests.

(4) A description of the railroad property or facilities to be used to conduct the tests.

(5) A detailed description of how the tests are to be conducted. This description shall include:

(i) An identification of the equipment to be tested;

(ii) The method by which the equipment is to be tested;

(iii) The criteria to be used to evaluate the equipment's performance; and

(iv) The means by which the test results are to be reported to FRA.

(6) A description of any special instrumentation to be used during the tests.

(7) A description of the information or data to be obtained.